

What is claimed is:

1. A method for estimating the position of a receiver  
5 receiving code modulated signals from at least one  
beacon, said method comprising:  
delimiting a region containing said receiver  
position based on a code modulated signal received at  
said receiver from at least one beacon and on available  
10 information including at least an initial information  
on said receiver position; and  
estimating said receiver position as a position  
within said delimited region which minimizes an error  
criterion.  
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2. The method according to claim 1, wherein said error  
criterion is at least one of a mean square error of a  
position within said delimited region, a mean absolute  
error of a position within said delimited region and a  
20 maximum error of a position within said delimited  
region.
3. The method according to claim 1, wherein said error  
criterion takes into account a probability density  
25 function indicating the probability density for  
positions in said delimited region to correspond to  
said receiver position.
4. The method according to claim 1, wherein estimating  
30 said receiver position comprises covering said  
delimited region with a grid comprising a plurality of  
grid points, and determining the receiver position as  
one of said grid points which minimizes among at least  
selected ones of said grid points said error criterion.  
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5. The method according to claim 4, further comprising:  
calculating an assumed time of arrival of code  
modulated signals from at least two beacons at each of  
said grid points based on the time of transmission of  
said code modulated signals and the time of flight of  
said code modulated signals to said grid points;  
comparing the differences between said calculated  
times of arrival with a threshold value; and  
excluding those grid points for which said  
differences exceed said threshold value before  
determining said grid point which minimizes among  
remaining grid points said error criterion.
6. The method according to claim 4, further comprising  
excluding certain grid points based on known conditions  
before determining said grid point which minimizes  
among remaining grid points said error criterion.
7. The method according to claim 1, comprising, in case a  
time available at said receiver is not accurate but a  
maximum deviation of said available time from an  
accurate time is known, determining sub-regions based  
on a code modulated signal received from at least one  
beacon of said available time for different possible  
times within said maximum deviation, and delimiting  
said region containing said receiver position based on  
a combination of said sub-regions and on available  
information including at least an initial information  
on said receiver position.
8. A receiver comprising for an estimation of the position  
of said receiver:  
a receiving portion for receiving a code modulated  
signal from beacons; and

5 a processing portion for delimiting a region  
containing said receiver position based on a code  
modulated signal received by said receiving portion  
from at least one beacon and on available information  
including at least an initial information on said  
receiver position, and for estimating said receiver  
position as a position within said delimited region  
which minimizes an error criterion.

10 9. A system for estimating the position of a receiver  
receiving code modulated signals from at least one  
beacon, said system comprising:

15 said receiver, which includes a receiving portion  
for receiving code modulated signals from beacons; and  
a device with a processing portion for delimiting a  
region containing said receiver position based on a  
code modulated signal received by said receiving  
portion from at least one beacon and on available  
information including at least an initial information  
20 on said receiver position, and for estimating said  
receiver position as a position within said delimited  
region which minimizes an error criterion.

25 10. The system according to claim 9, wherein said device is  
combined with said receiver.

30 11. The system according to claim 10, further comprising a  
mobile communication network, wherein said device is a  
mobile terminal adapted to communicate with said mobile  
communication network.

12. The system according to claim 9, wherein said receiver  
is combined with a mobile terminal and wherein said  
device is a network element of a mobile communication

network, said mobile terminal being adapted to  
communicate with said mobile communication network.

13. A software program product in which a software code for  
5 estimating the position of a receiver receiving code  
modulated signals from at least one beacon is stored,  
said software code realizing the following steps when  
running in a processing unit:
- 10 delimiting a region containing said receiver  
position based on a code modulated signal received at  
said receiver from at least one beacon and on available  
information including at least an initial information  
on said receiver position; and
- 15 estimating said receiver position as a position  
within said delimited region which minimizes an error  
criterion.